

Astrophysical Research Consortium  
Sloan Digital Sky Survey (SDSS) Advisory Council

Minutes of June 9, 2003 Meeting  
Sunspot New Mexico Visitors Center

*(sdss-general summary version of minutes)*

OPEN SESSION

**(1-2) TIME AND ATTENDEES**

The meeting convened at 8:35 am and adjourned at 4:40 pm MST.

Council members present and their institutions were: Suzanne Hawley and Craig Hogan from University of Washington; Michael Turner from University of Chicago; Allen Sinisgalli and Scott Tremaine from Princeton University; Timothy Heckman from Johns Hopkins University; Kenneth Stanfield and Edward (Rocky) Kolb from Fermilab; Jeffrey Pier from US Naval Observatory; and Rene Walterbos from New Mexico State University.

Council members unable to attend the meeting were: David Oxtoby from University of Chicago; Allen Rowe and John Bahcall from Institute for Advanced Study; Theodore Poebler from Johns Hopkins University; Sadanori Okamura and Takashi Ichikawa from Japan Participation Group; Kenneth Johnston from US Naval Observatory; Simon White from Max Planck Institute for Astrophysics; Hans-Walter Rix from Max Planck Institute for Astronomy; William Press from Los Alamos National Laboratory; and David Jasnow from University of Pittsburgh.

Angela Olinto from University of Chicago was an alternate for David Oxtoby and had a proxy enabling her to vote for Oxtoby. Heckman had a proxy for Poebler.

At the Council's request/invitation, certain guests were present for all of the meeting conducted in open session. They were: John Peoples, SDSS Director; William Boroski SDSS Project Manager; Rich Kron, SDSS Spokesperson; Bruce Gillespie, APO Site Operations Manager; Bruce Balick, UW BoG representative; Bryan Laubscher, Los Alamos National Laboratory; Alan Uomoto, Johns Hopkins University; Michael Strauss, Princeton University; Kenneth Paap, New Mexico State University. Michael Evans, ARC Business Manager, was present during the entire meeting except for a short period of time during the morning executive session.

**(3) INTRODUCTION/HOUSEKEEPING**

Jeffrey Pier, Chair of the Council, chaired the meeting. All except the beginning and final segments of the meeting were conducted in open session. Evans declared that Council members present constituted a quorum as defined by the PoO and thus was capable of conducting business. He also reminded those present that the Council operates on the majority vote method of decision-making and that the BoG Chair and representatives of the Affiliate MOU Partners are non-voting members.

#### (4a) SDSS DIRECTOR'S REPORT

Peoples provided a comprehensive progress report augmented by a Powerpoint presentation with numerous graphs and diagrams. The presentation slides are shown in Appendix 1 of these minutes.

Baseline and accomplishments through 06/02/2003

Imaging Survey (sq. degrees)	Baseline	Actual
Northern Survey (Unique)	6134	5575
Southern Survey (Unique)	745	738
S. Equatorial Stripe (Good Unique)	2053	1908
Imaging Subtotal	8187	7483

Spectroscopic Surveys	Baseline	Actual
Northern Survey-Plates	807	651
Southern Survey-Plates	148	153
Southern Equatorial- Special Plates	165	139
Spectroscopy Subtotal	972	790

The forecast total for the Northern Survey is approx. 1500 plates.

Summary of Spectra through 06/02/03

Spectra by category in the main spectroscopic survey

	North	South
Galaxies (all)	283,160	67,920
Main	243,057	56,699
LRG	33,062	8,258
Other	7,041	2,963
Quasars	38,454	8,258
Stars	48,897	10,993

If we continue to image the Northern Galactic Cap (NGCap) at our current rate with high priority we will image about 7,900 sq degrees unique within the minimum contiguous area by June 30, 2005. When areas outside the minimum contiguous area are included, the total amount of image data in the NGCap will be about 8,400 sq. degrees. There will still be a hole in the minimum contiguous area of about 600 sq. degrees unique on June 30, 2005. Assuming priority is given to imaging in the NGCap until the gap is filled, we can expect to obtain somewhat less than 600,000 main galaxy spectra in the NGCap by June 30, 2005. After including the spectra of 68,000 main galaxies in the three southern stripes we can expect to obtain the spectra of somewhat more than 600,000 main galaxies. This will fall short of our goal of 1,000,000 main galaxies.

If we continue to image the NGCap with high priority after June 30, 2005 the minimum contiguous area in the NGCap contained between stripes 10 and 37 will be filled the first quarter of 2006. The uncertainty of weather could delay this by one year. If the image data fill the gap by the first quarter of 2006 and if the survey in the NGCap is dedicated to spectroscopy thereafter the spectra of all objects in the minimum contiguous area of the NGCap that meet the SDSS selection criteria will be obtained by the end of June 2007. (barely) The Number of main galaxies in this sample will be 700,000.

The approved total budget for 2003 vs the current total 2003 cost forecast is \$5,200K vs \$5,113. The approved cash budget for 2003 vs the current cash 2003 cost forecast is \$3,400 vs \$3,400.

Cost to Complete the five-year survey cost comparison:

November 20, 2001	\$28,178K
November 24, 2002	\$28,008K
June 6, 2003	\$27,837K

The cash commitments are sufficient to complete the 5-year survey including a minimum closeout plan costing ARC \$223K. When the 5-year survey is closed out the will be an estimated cash surplus of \$971K. The surplus could be used to close the gap if a new successful proposal could pay for operations between July and December starting in 2004.

There was some discussion of using the surplus to close the gap and or partially pay down the \$2.7M debt to the four member universities. No decision on the use of the surplus will be made until there is a further review of the cost of extending the survey and there have been further discussions with the member institution regarding the debt.

#### **(4b) SDSS PROJECT MANAGERS REPORT**

Boroski provided a comprehensive progress report augmented by a Powerpoint presentation with numerous graphs and diagrams. The presentation slides are shown in Appendix 2 of these minutes. Please see the appendix for detailed data release information, the following only summarizes the information presented:

Regarding DR1, the original plan was to release DR1 to the collaboration in early fall of 2002 and to the public during the week of January 1, 2003. The preliminary DAS released to the collaboration November 2002. The beta version of DR1-DAS was released to the public on April 4, 2003. The beta version of DR1-CAS was released to the collaboration on April 11, 2003. The beta version of DR1-CAS is scheduled to be released to the public on June 11, 2003. The beta versions are now considered final DR1 release versions.

Regarding DR2, efforts are now focused on getting photo5\_4 reductions into the hands of the collaboration and preparing for the public DR2 release. DR2 imaging data are processing is well underway. DR2-DAS version 1 is scheduled to be released to the collaboration on August 29, 2003, with DR2-DAS final version scheduled to be released to the collaboration on October 31, 2003 and to the public on January 12, 2004. DR2-CAS version 1 is scheduled to be released to the collaboration on September 12, 2003, with DR2-DAS final version scheduled to be released to the collaboration on November 12, 2003 and to the public on January 12, 2004.

Regarding DR3, data collected through July 2003 will be included in DR3. DR3 data processing will begin as soon as DR2 data processing is complete. The scheduled public release of DR3 is October 1, 2004.

#### **(4c) SDSS SPOKESPERSON REPORT**

Kron provided a comprehensive progress report augmented by a Powerpoint presentation with numerous graphs and diagrams. The following topics were presented and discussed: publications, DR1, dissertations, collaboration Council activities, AAS Special Sessions, Collaboration meetings, press releases, Working Group activities and science accomplishments. Please see the presentation slides shown in Appendix 3 of these minutes for more details. You will see in Kron's slides 17 through 27 show the diversity of SDSS science currently being accomplished.

Since Kron will become the Director July 1<sup>st</sup>, the CoCo has started the search for SDSS Spokesperson candidates. The Spokesperson election will take place later this year. Until a new Spokesperson is elected Kron will continue to fulfill the Spokesperson's responsibilities.

#### **EXECUTIVE SESSION**

*(The Executive Session section of these minutes has been removed from the sdss-general version of these minutes.)*

#### **OPEN SESSION**

#### **(7) Report of the Futures Committee**

Hawley distributed the Report of the SDSS Futures Committee on SDSS Extension White Papers. The committee had two recent conference calls, May 28<sup>th</sup> and June 4<sup>th</sup>, in preparation of the report. The goals for the committee were:

A. Assess science justification for each proposed extension project. Other points for discussion include scientific interest from the collaboration for the project and fundability.

B. Provide recommendation for, how the collaboration should proceed, based on results of (A).

The four white papers included in the report are: 1. Legacy Proposal (filling the gap), 2. SEGUE proposal (Galactic Structure), and two STSS Proposals (time domain) 3a. Near Earth Asteroids and 3b. Supernovae.

The scientific justification, scientific interest within the collaboration and fundability of each proposal as well as the recommendations of the committee are presented in the report. The entire Futures Committee report is included in these minutes as Appendix 4.

In summary the recommendations of the Futures Committee are:

1. The Committee was in agreement that the proposed science projects submitted in the white papers had sufficient scientific merit, and passed the "sniff test" at the level that funding agencies could now be approached.

2. The recommendation of the Futures Committee is that the SDSS Director and Management, in consultation with the authors of the various projects, carry out a series of discussions with the funding agencies and foundations described in the proposals. Help has been offered from various sources in the white papers, and the authors may have additional ideas about the best approaches to make to the agencies/foundations.

3. The results of this set of discussions, which should commence immediately and perhaps will last through the summer, should lead to a decision about which proposal, or combination of proposals, to take forward to the next stage of a serious funding proposal effort. Many on the committee feel that there is considerable urgency, and that this decision must be made very soon (Fall, 2003).

4. The feedback provided by the committee should be communicated to the white paper authors, with the hope that they will begin preparing for the next stage effort.

(8) Comments from the representatives included the following:

Princeton: Zeljko Ivezić is probably not interested in NEA. The AC needs to move quickly to prepare funding proposals. What are the members going to contribute? Princeton's priorities are: 1. fill the gap and 2. galactic structure. Depending on the selected proposal, Princeton would make a financial commitment.

Fermilab: We need a bottoms up estimate, including in-kind contributions, before we go to sponsors. We need to understand the costs. Some project options would be more expensive than others. NEA is not a Fermilab priority.

Chicago: Chicago priorities are: 1 fill the gap, 2. galactic structure and 3. supernovae. We need to settle-up on the original survey goals first.

Johns Hopkins: JHU priorities are galactic structure and filling the gap. JHU was not sure about investing more funds.

Max Planck: (by Pier for White) MPA will stay involved through 2005. MPA supports the fill the gap proposal. Galactic structure sounds interesting to MPA. Some funding might be possible.

Washington: UW priorities are with the time domain studies and filling the gap.

U.S. Naval Observatory: The USNO is committed to the SDSS through 2005 but is under a considerable cash crunch so a commitment to an extension is unlikely.

NMSU: NMSU is only an affiliate MOU member but has a strong interest in extending the survey. It's first priority would be to fill the gap. Time domain studies with follow-up on the NMSU 1-meter hold some interest. NMSU will go with the majority. NMSU is pursuing additional state funding for astronomy. NMSU will be paying off their SDSS buy-in through 2010.

Los Alamos National Laboratories: LANL has an interest in all the proposals but most of the proposals are not in alignment with areas LANL plans to expand.

12:05 - 1:50 Lunch break and the Donald R. Baldwin Operation Building Dedication Ceremony at APO.

#### CONTINUED DISCUSSION OF FUTURES COMMITTEE REPORT

M. Turner: By November we need to know the names and level of effort of those individuals interested and the institutional investment amounts.

Tremaine: Let's take NEA off the table and move full speed ahead with a proposal. NSF Advance Technologies and Instrumentation proposal are due in August. First an unsolicited proposal for up to \$200K then a proposal for \$5M.

Kron: We need to write a science plan, operations plan and a business plan. If weather is better than anticipated some funds could go back to the sponsors. Two years at an approximate total cost of \$10M. The cash requirements would be approximately \$3M - \$4M per year. Funding sources: Sloan Foundation maybe \$1M, NSF maybe \$1M/yr.

Stanfield: Extend the review of the plan and cost estimate. Review all tasks and contingencies.

Peoples: We know what an extension of the SDSS would cost; we do not know what the SEGUE (galactic structure) proposal will cost.

M. Turner: An internal and external review prior to submitting a proposal would be good.

Kron: Schedule an internal review by September 1, and external review by October 1 and have an AC decision by mid-November.

Peoples: We could be prepared to submit a good proposal to the NSF by the August 2004 deadline.

Kron: Kron will meet with Wayne van Citters at NSF on June 18, he may get an idea then as to how receptive the NSF will be to providing additional funding to extending the survey.

Peoples: SDSS science is a lead-in for future Gemini programs.

Stubbs: Training the general astronomy community to use SDSS data would help in securing future funding. Telescope System Instrumentation Program (TSIP) funding maybe worth considering as a source of additional funds for SDSS.

Sinisgalli: If the SDSS data is released to the general astronomical community very early it will make it more difficult to get institutional funding.

M. Turner: Keck and the Research Corporation are possible sources of funding.

Pier: We have the necessary equipment for the NEA option, there is the good potential of receiving funding for the NEA option but the interest within the collaboration is the weakest for this proposal.

M.Turner: If SDSS submits a proposal for NEA funding it may appear to sponsors that we are desperate for funding.

Action: Kolb made the motion, seconded by Tremaine, that the NEA be removed from the list of potential options. The motion passed unanimously with one abstaining.

The priorities of the three remaining options are: fill the gap, SEGUE (galactic structure) and supernovae (SN). Some members were worried that SN may get watered down if we attempt all three remaining options.

In regards to the first priority, filling the gap, the committee had reported that there was wide spread agreement that it is of very strong interest to the collaboration to fill the gap in photometry (everyone) and spectroscopy (most members).

Given the priorities above, Kron and Boroski were directed recruit/solicit assistance from within the collaboration (white paper authors and others) to prepare a coordinated science plan, operations plan and business plan for an extended survey. Kron is to get Jim Gunn's involvement as soon as practical. Hogan, who organized the Time Domain white paper, suggested that Josh Frieman would be a good substitute for him to assist with the supernovae portion of the planning. Funding from collaborators who are not currently at member institutions, RPI for an example, needs to be investigated further.

Action: Hawley made the motion, seconded by Hogan, that the Futures Committee had completed its duty and was now dissolved. The motion passed unanimously with nobody abstaining.

#### EXECUTIVE SESSION

*The Executive Session section of these minutes has been removed from the sdss-general version of these minutes.*

#### NEXT MEETING

The next meeting of the Council will be sometime in the fall at a location yet to be determined. Likely it will be in conjunction with the Fall SDSS collaboration Meeting planned to be held at Fermilab. Subsequent to the meeting the Collaboration Meeting dates were set for October 2-3, 2003 so the next AC meeting will most likely be October 1<sup>st</sup>.

Respectfully submitted,  
Michael L. Evans  
ARC Business Manager

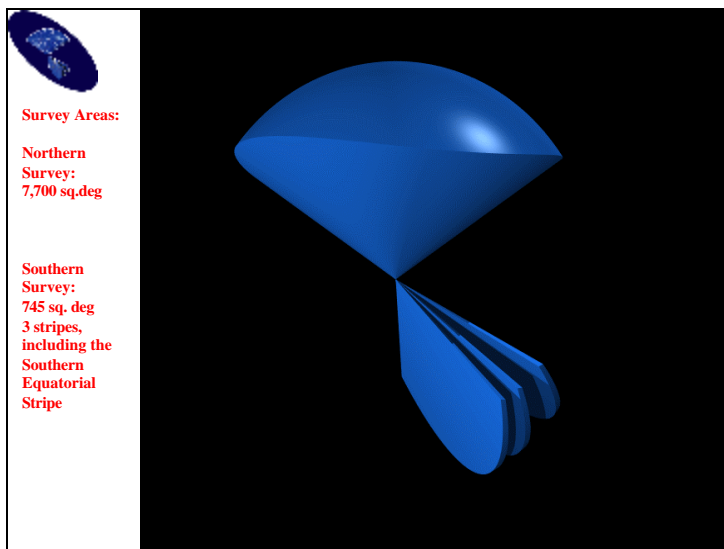
## APPENDIX 1

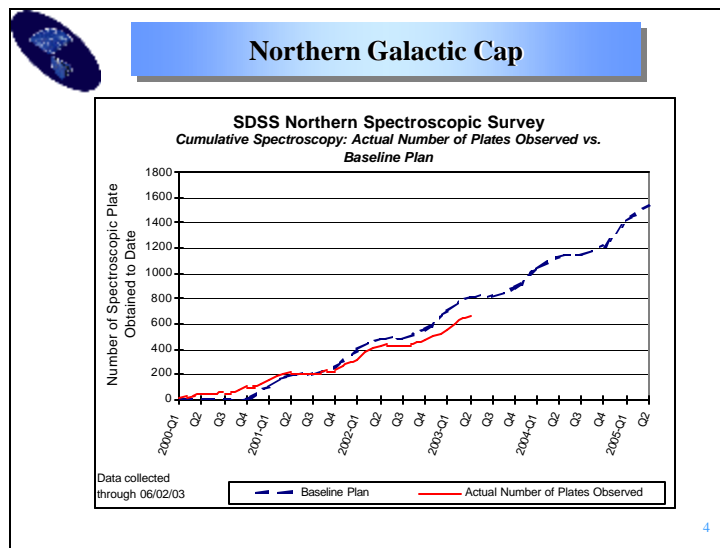
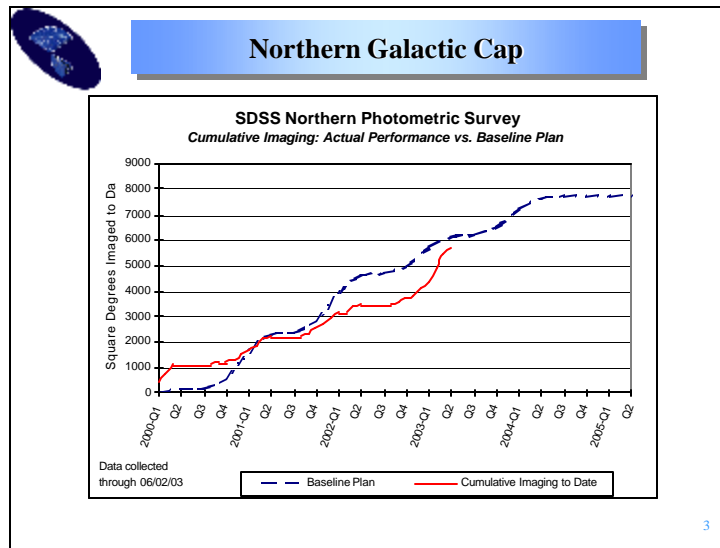
John Peoples presentation slides.

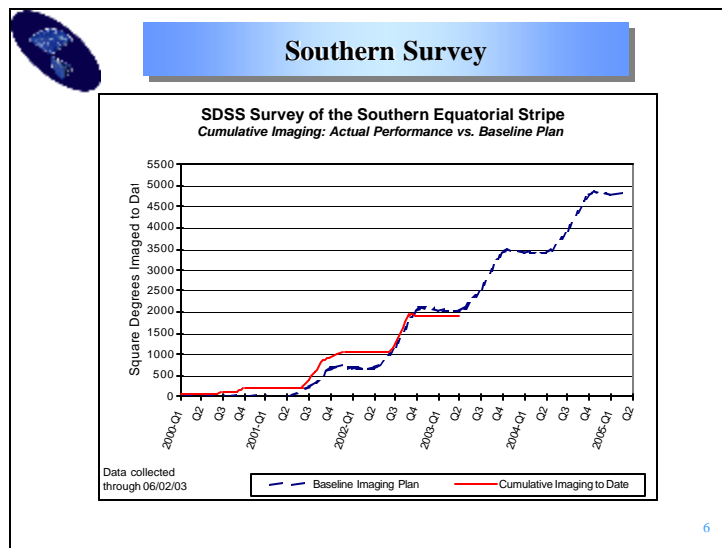
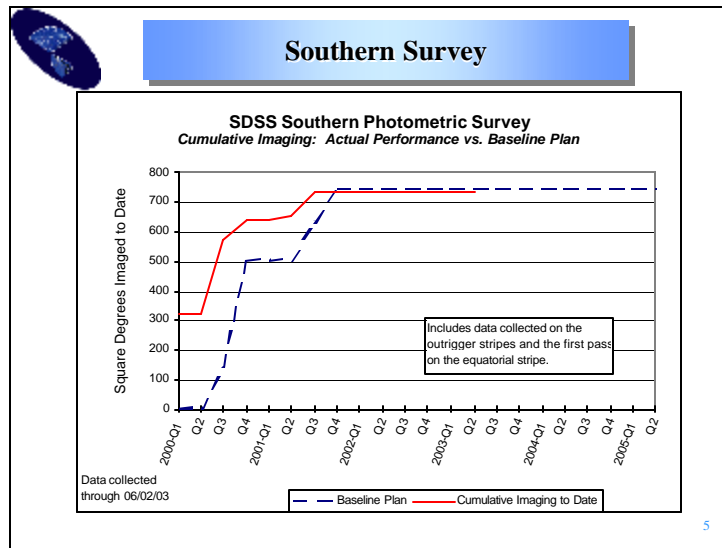
JP Slide 1




JP Slide 2








JP Slide 7



<b>Baseline and Accomplishments through June 2, 2003</b>		
	<i>Baseline</i>	<i>Actual</i>
<i>Imaging Surveys</i>		
Northern Survey (Unique)	6134	5575
Southern Survey (Unique)	745	738
S. Equatorial Stripe (Good-Unique)	2053	1908
Subtotal imaging	<b>8187</b>	<b>7483</b>
<i>Spectroscopic Surveys</i>		
Northern Survey-Plates	807	651
Southern Survey-Plates	148	153
Southern Equatorial -Special Plates	165	139
Subtotal spectroscopy	<b>972</b>	<b>790</b>


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<b>Summary of spectra through June 2, 2003</b>		
<i>Spectra by category in the Main spectroscopic survey</i>		
	<i>north</i>	<i>south</i>
Galaxies (all)	<b>283,160</b>	<b>67,920</b>
<i>Main</i>	243,057	56,699
<i>LRG</i>	33,062	8,258
<i>Other</i>	7,041	2,963
Quasars	<b>38,454</b>	<b>8,258</b>
Stars	<b>48,897</b>	<b>10,993</b>


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### Forecast of SDSS Imaging by June 30, 2005

- \* The survey area in the Northern Galactic Cap (NGCap) between stripes 10 and 37, the minimum contiguous area, contains 8,545 sq ° unique. The footprint area is 7,100 sq °.
- \* If we continue to image the NGCap at our current rate with high priority we will image about 7,900 sq ° unique within the minimum contiguous area by June 30. When areas outside the minimum contiguous area are included, the total amount of image data in the NGCap will be about 8,400 sq ° unique.
- \* This extrapolation is based on acquiring image data at the average rate over the past three years. There will still be a hole in the minimum contiguous area of about 600 sq ° unique on June 30, 2005.


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### Forecast of SDSS Spectroscopy by June 30, 2005

- \* Assuming that priority is given to imaging in the NGCap until the gap is filled, we can expect to obtain somewhat less than 600,000 main galaxy spectra in the NGCap.
- \* After including the spectra of 68,000 main galaxies in the three southern stripes we can expect to obtain the spectra of somewhat more than 600,000 main galaxies.
- \* This will fall short of our goal of 1,000,000 main galaxies.


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### Forecast of SDSS Imaging by June 30, 2007

- \* If we continue to image the NGCap with high priority after June 30, 2005 the minimum contiguous area in the Northern Galactic Cap (NGCap) contained between stripes 10 and 37 will be filled during the first quarter of 2006.
- \* This extrapolation is based on imaging at the average rate of imaging during the past three years. In order to fill the gap another 3,260 sq ° unique needs to be imaged as of 3 June 2003.
- \* The uncertainty due to weather could delay this achievement by at least one year.

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### Forecast of SDSS Spectroscopy by June 30, 2007

- \* If the image data fill the gap by the first quarter of 2006 and if the survey in the NGCap is dedicated to spectroscopy thereafter the spectra of all objects in the minimum contiguous area in the NGCap that meet the SDSS selection criteria will be obtained by the end of June 2007. (barely)
- \* The number of main galaxies in this sample will be about 700,000.

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<b>Comparison of the Approved Total Budget for 2003 with the Cost Forecast for 2003</b>		
<i>In \$K</i>		
	2003* Approved	2003† Forecast
Survey Management	461	551
Collaboration Affairs	16	16
Observing Systems	1,332	1,260
Data Processing & Distribution	1,554	1,540
Observatory Support	1,447	1,447
ARC Corporate Support	189	135
Management Reserve	201	163
Total	5,200	5,113

\*2003 Total Budget approved by ARC on Nov 25, 2002  
† Forecast of 2003 expenditures as of June 6, 2003

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<b>Comparison of 2003 ARC Cash Budget with Forecast of 2003 Cash expenditures</b>		
<i>In \$K</i>		
	2003 * Approved	2003† Forecast
Survey Management	245	335
Collaboration Affairs	16	16
Observing Systems	769	742
Data Processing & Distribution	533	562
Observatory Support	1,447	1,447
ARC Corporate Support	189	135
Management Reserve	201	163
Total	3,400	3,400

\*Approved by ARC November 25, 2002  
† June 6, 2003 forecast (includes unbudgeted cash expenses)


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### Comments on the Proposed 2003 Budget

- \* **The changes in the 2003 ARC cash budget are:**
  - Increase for support of the Time Domain Test for the STSS proposal.
  - Increase for additional computer purchases for data distribution at Fermilab.
  - Decrease in purchases for improvements in Observing Systems and salary support of remote personnel
  - Increase to support the New Director starting July 1, 2003
- \* **The cost changes in the 2003 in-kind budget are:**
  - Decrease of in-kind support for observing systems

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### Cost to Complete the Five-year Survey January 2005 to October 2005

*In \$K*


Estimated total cost to completion

November 20, 2001	28,178
November 25, 2002	28,008
June 6, 2003	27,837

The estimated total cost to completion has been stable for three years.  
The ARC cash to completion has been stable at \$17,565 K for the same time.

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<b>Cash commitments to complete the Five-year Survey</b>	
<b>Cash commitments for 2004-2005</b>	
▪ A P Sloan Foundation (cash)	\$1,000K
▪ NSF (AST-0096900) (cash)	\$1,542K
▪ New Partners Fund (cash)	\$3,050K
▪ Japan Participation Group (cash)	\$163K
▪ Potential Interest earnings (2003-2005)	\$96K
▪ Estimated carry over from 2002	\$180K
<b>Total cash commitments</b>	<b>\$6,036K</b>

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<b>Analysis of ARC costs for 2003-2005*</b>	
Cash (ARC) required to finish the survey	5,065
Available funds including interest (\$96K)	6,036
Estimated surplus at closure	971

\* For the period January 1, 2004 to October 1, 2004

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Note: the estimated surplus at closure in Nov-02 was \$770K.




### Resources available to complete the Five-year Survey

Commitments for in-kind resources for 2004-2005

▪ Fermilab (in-kind)	\$2,659K
▪ Japan Participation Group (in-kind)	\$15K
▪ USNO (in-kind)	\$205K
▪ LANL (in-kind)	\$121K
<b>Total in-kind Resources for 04-05</b>	<b>\$3,000K</b>

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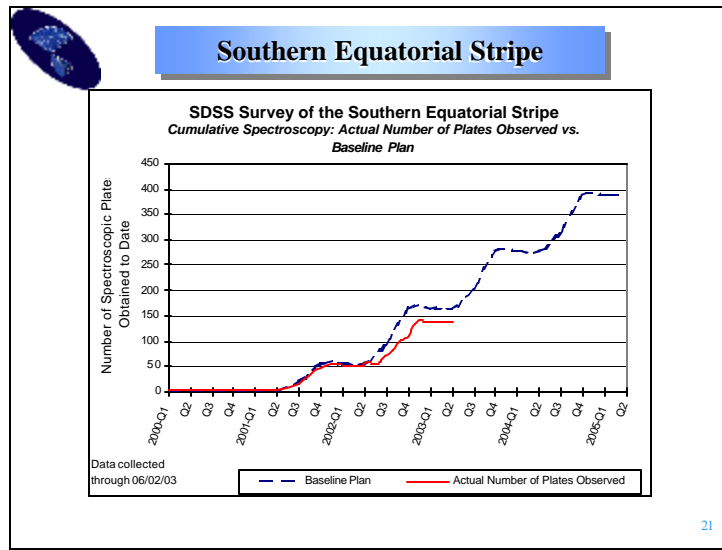


### Financial Outlook

- The cash commitments are sufficient to complete the 5-year survey including a minimum closeout plan costing ARC \$223K.
- When the five year survey is closed out there will be an estimated cash surplus of \$971K.
- This surplus could be used to close the gap if a new successful proposal could pay for operations between July and December starting in 2004.

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Note: The surplus could be used to close the gap and/or partially pay down the \$2.7M debt to the four member universities. The current close-out schedule is July 1 through September 30, 2005.

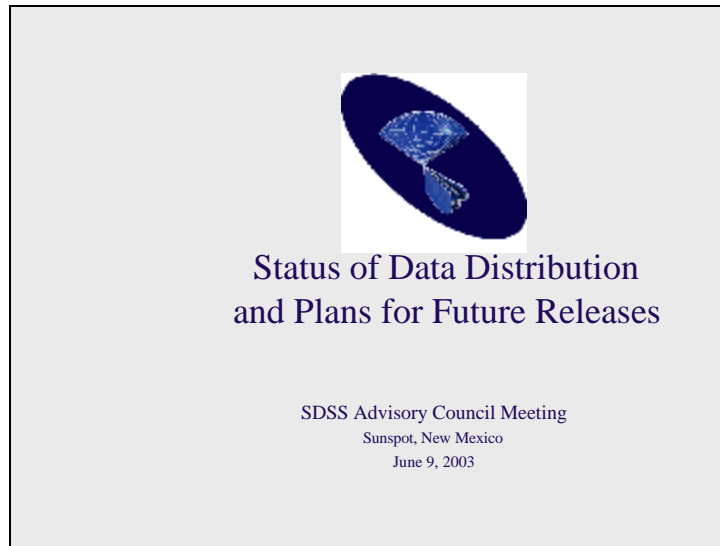


Additional comments: The portion of the sky that is needed to fill the gap is visible in the Spring. It's estimated that two half years are required to complete the gap so the gap could be completed by 7/1/07.

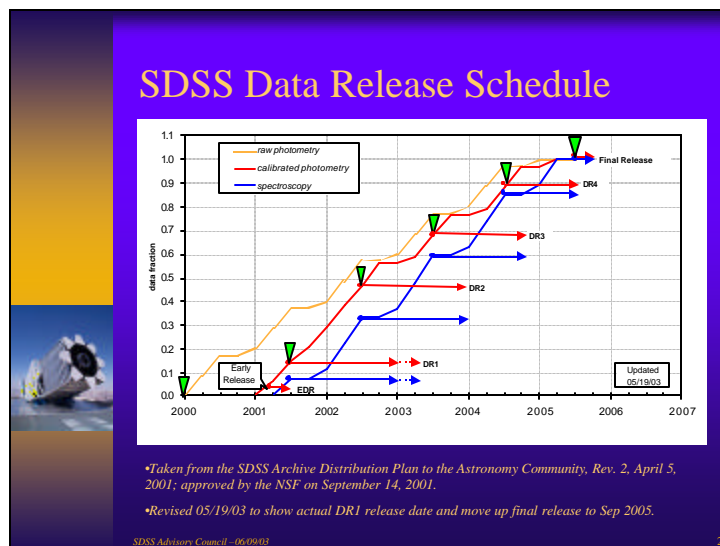
## APPENDIX 2

Bill Boroski's presentation slides.

BB Slide 1



BB Slide 2



## Data Distribution Methods

- ◆ Data Archive Server
  - Provides access to pixel data (spectra, atlas images, raw frames, corrected frames, binned frames), color images and plots in the form of flat files.
  - Includes simple interfaces that allow queries by position, object lists, colors, magnitudes, spectral classification, etc.
- ◆ Catalog Archive Server
  - A Structured Query Language (SQL) database of objects
  - Loaded from the DAS binary FITS files
  - Enables more sophisticated queries and construction of catalogs containing various classes of astronomical objects.
- ◆ Helpdesk support
  - Helpdesk established at Fermilab that provides e-mail support for collaboration and public users
  - EAG responds to DAS questions; JHU group will respond to CAS questions

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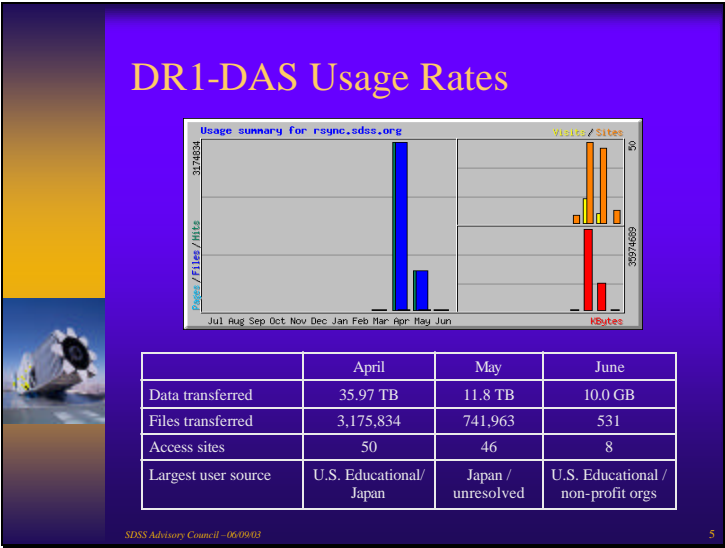
## Data Release 1

- ◆ Original plan was to release DR1 to the collaboration in the early fall of 2002 and to the public during the week of January 1, 2003
- ◆ Actual release dates
  - Preliminary DAS released to collaboration in November, 2002.
    - Data access tools and documentation not complete.
  - Beta version of DR1-DAS released to public on April 4
  - Preliminary CAS released to collaboration in January, 2003.
    - No tiling data; access tools and documentation incomplete.
  - Beta version of DR1-CAS released to collaboration on April 11
  - Beta version of DR1-CAS scheduled for public release this Wednesday, June 11.
  - Beta versions now considered final DR1 release versions

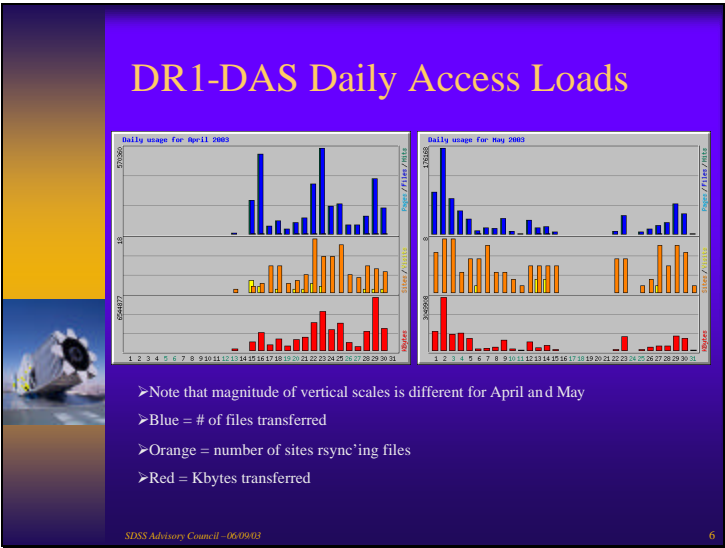
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BB Slide 6



## Data Release 2

- ◆ Efforts are now focused on getting photo 5\_4 reductions into the hands of the collaboration and preparing for the public DR2 release.
- ◆ Involves:
  - Reprocessing all data collected through June 2002 with photo 5\_4 and rerun 23.
  - Loading outputs into the DAS, updating documentation, extensive testing and evaluation.
  - Implementing the CAS loading process into the Fermilab production operation, loading outputs into the CAS, updating documentation, and extensive testing and evaluation.

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## DR2 Preparation: *Data Processing Status*

- ◆ Imaging data re-processing is well underway.
  - Second priority to processing new imaging data.
- ◆ Spectro data re-processing on hold pending delivery of new spectro2d code.
  - Target delivery date is end of June
  - Once delivered, we anticipate completing re-processing within one month.
- ◆ Delays
  - Recent corruption of opdb may cause 2-week delay.
  - Forced relocation of computers at Fermilab may cause 2-week delay.
  - Result is potential one-month slippage in target date for finishing DR1 data set reprocessing (from July 8 to ~Aug 1)

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## DR2 Preparations: DAS Status

- ♦ Minimal changes planned for DAS interface functionality
  - Mgmt Committee imposed constraint that no changes be made to DAS until collaboration has access to CAS for at least three months.
  - Avoids duplication of effort if CAS already provides desired interfaces, or is the more appropriate tool for requested improvement.
- ♦ DAS back-end modifications to access data in SQL Server tables.
  - DAS currently utilizes a MySQL database
  - If CAS implemented at Fermilab, DAS must be modified to access data from SQL Server database.
- ♦ Re-organization of data products on Fermilab computers
  - Organize by function and CPU usage requirements
  - Improve system reliability, robustness, and ease of maintenance
  - Requires purchase of two web servers (est. cost = \$9K)

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## DR2 Preparations: CAS Status

- ♦ Assessment for whether CAS is ready for production deployment at Fermilab is underway
  - New Windows operating system and SQL Server code has been installed on CAS machines at FNAL.
  - Scripts for generating CSV files have been delivered and used by the EAG to generate the 5\_4 testload.
  - An SQL Server database has been configured and loaded (once) with the full 5\_4 testload.
  - The CAS web server front end interface has been installed and used to query the testload database.
  - Documentation is continuously being updated as the loading process is debugged.
  - Target date for completing the testload was June 2; testload was finished and the data queried on June 5. But...

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## DR2 Preps: CAS Status (cont'd)

- ◆ Remaining issues on CAS deployment
  - Resolving computer security problems
    - Production loading occurs on multiple machines. Computer security requirements are making this difficult to implement at Fermilab. Testload was done on a single machine (fall-back).
  - Redoing the testload to verify loading situation
    - On a single machine, end-to-end, this week
    - On multiple machines, as the system will run in production
  - Adequate documentation
    - Loading the CAS is a very complicated operation
    - Process flow diagrams and suitable documentation will help transfer knowledge of “what’s under the hood.”
  - Improving Windows expertise
  - Personnel availability and support
  - Additional hardware purchases to support DR2
  - Incremental loading

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## DR2: DAS Strawman Schedule

	Target Completion <u>(revised)</u>
Reprocess DR1 imaging data with Photo v5_4	Aug 1
Reprocess DR1 spectro data with rerun 23	Aug 1
Process DR2 imaging data with Photo v5_4	Oct 1
Process DR2 spectro data with rerun 23	Oct 1
Data Archive Server	
Load DR2-DAS with DR1 v5_4 and rerun 23 reductions	Aug 15
Testing group evaluation of DR2-DAS with DR1 data	Aug 29
DR1-DAS version 1 released to collaboration	Aug 29
Load DR2-DAS with DR2 v5_4 and rerun 23 reductions	Oct 15
Testing group evaluation of DR2-DAS with DR2 data	Oct 31
DR2-DAS final version released to collaboration	Oct 31
DR2-DAS released to public	January 12

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BB Slide 13

DR2: CAS Strawman Schedule	
	Target Completion (revised)
Reprocess DR1 imaging data with Photo v5_4	Aug 1
Reprocess DR1 spectro data with rerun 23	Aug 1
Process DR2 imaging data with Photo v5_4	Oct 1
Process DR2 spectro data with rerun 23	Oct 1
Catalog Archive Server	
Load DR2-CAS with DR1 v5_4 and rerun 23 reductions	Aug 29
Testing group evaluation of DR2-CAS with DR1 data	Sep12
DR1-CAS version 1 released to collaboration	Sep12
Load DR2-CAS with DR2 v5_4 and rerun 23 reductions	Oct 29
Testing group evaluation of DR2-CAS with DR2 data	Nov 12
DR2-CAS final version released to collaboration	Nov 12
DR2-CAS released to public	January 12

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DR2 Schedule Summary	
♦ Schedule is extremely aggressive and there is no float.	
– Critical that code changes and tweaking stop as soon as possible .	
♦ Collaboration wants access to new data as soon as possible. We understand this.	
– Ability to do incremental CAS loads needs to be verified in production mode.	
– Has direct impact on how soon collaboration gets access to newly processed data.	
♦ Collaboration access prior to public release	
– DAS flat files: 10 weeks	
– Fully loaded CAS: 8 weeks	
♦ We must not miss the DR2 release date.	

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## Data Release 3

- ♦ Will include all data collected through this July
- ♦ Data processing starts on this data as soon as DR2 data processing is finished.
- ♦ Scheduled for public release on Oct 1, 2004.
  - We may move this up to July 2004.
- ♦ We will not change pipelines for DR3
  - All releases through at least DR3 will contain data processed with the current versions of Photo, idlspec2D, and spectro1D.
  - No new features are planned.
  - Only changes will be to address serious bugs.
- ♦ We will use the period between now and the DR2 release to evaluate DAS and CAS interfaces and identify appropriate improvements
  - We expect to maintain these interfaces through at least DR3.

## Revised Release Schedule (*Tentative*)

	Contains imaging data collected through	Data available to the collaboration in the form of flat files through the DAS	Tentative public release date
DR1 (5_4 reductions)	July 2001	Sep 2003	Jan 2004
DR2	July 2002	Nov 2003	Jan 2004
DR3	July 2003	Dec 2003*	July 2004
DR4	July 2004	Aug 2004*	July 2005
Final Release	July 2005	Aug 2005*	Sep 2005

\*Dates for DR3 and beyond are very preliminary estimates.

APPENDIX 3

Rich Kron's presentation slides.

RK Slide 1

**Spokesperson's Report to the SDSS  
Advisory Council - June 9, 2003**

publications  
DR1  
dissertations  
Collaboration Council activities  
AAS Special Sessions  
Collaborations meetings  
press releases  
Working Group activities  
science accomplished

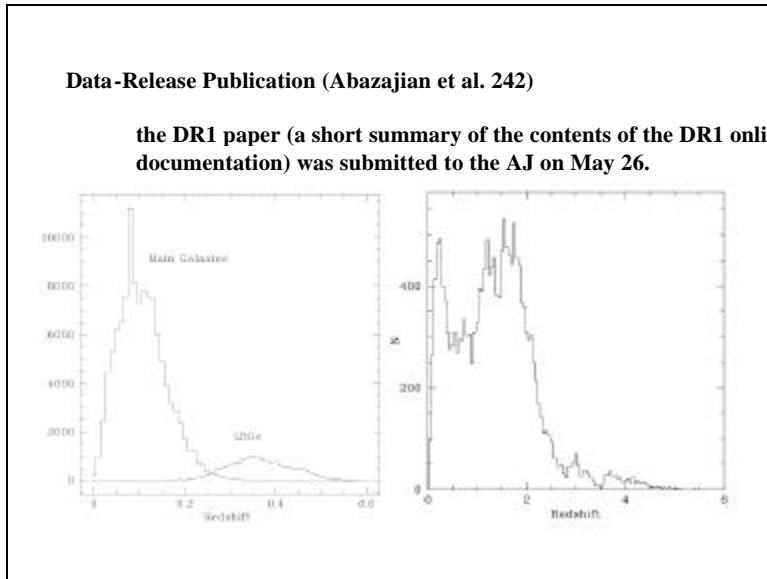
RK Slide 2

**Scientific Publications**

total of 253 papers posted to SDSS web page  
of these, 80 have been posted in the past 12 months  
of these, 59 are scientific papers submitted (or soon to be  
submitted) to a refereed journal

**Technical Publications in the Past 12 Months**

Astrometric Calibration of the Sloan Digital Sky Survey  
(Jeffrey Pier)  
The Sloan Digital Sky Survey Moving Object Catalog  
(Zeljko Ivezić)  
Spectroscopic Target Selection in the Sloan Digital Sky Survey: The  
Main Galaxy Sample  
(Michael Strauss)



## SDSS Data Release 1

Sloan Digital Sky Survey

**Where to Start**  
[News and Updates](#)  
[Tutorial](#)  
[Data Products](#)  
[Data Access](#)  
[Sky Coverage](#)  
[Instruments](#)  
[Data Flow](#)  
[Algorithms](#)  
[Glossary](#)  
[Help and Feedback](#)  
[Search](#)

The Sloan Digital Sky Survey (see [www.sdss.org](http://www.sdss.org) for general information) will map one-quarter of the entire sky and perform a redshift survey of galaxies, quasars and stars. The DR1 is the first major data release and provides [images](#), [images](#), [catalogs](#), [spectra](#), and [redshifts](#) for download.

This is the "beta" version of DR1. [About DR1](#) explains why this is a "beta" release.

Please refer to the [credits page](#) for our sources of funding, participating institutions, how to acknowledge the use of SDSS data in your publications. Please also note how to refer to SDSS sources in your publications using the proper [AJ nomenclature for SDSS sources](#).

**News:** Network maintenance will very briefly interrupt data access on May 29th. A planned power outage will briefly interrupt data access on May 30th. [More...](#)

SDSS DR1 Imaging Sky Coverage (All-sky projection of Equatorial coordinates)

SDSS DR1 Spectral Sky Coverage (All-sky projection of Equatorial coordinates)

### Imaging

Footprint area	2569 sq. deg.
Imaging catalog	53 million unique objects
Data volume	Images: 2.338 TB Catalogs: 0.462 TB
Magnitude limits (90% detection repeatability for point sources)	u: 22.0, g: 22.2, r: 22.2, i: 21.3, z: 20.5
PSF width	1.4" median in r
Photometric calibration	r: 3%, g: 2%, i: 2%, z: 3%
Astrometry	< 0.1" rms absolute per coordinate

### Spectroscopy

Spectroscopic area	1556 sq. deg.
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## YALE News Release

CONTACT: Jacqueline Weaver 203-432-8555 #164

For Immediate Release: May 26, 2003

### *Yale Astronomer Sees New Gravitational Lens*

**New Haven, Conn.** -- Using a snapshot technique, a Yale astronomer has discovered a bright new gravitational lens.

The gravitational lens was observed on April 25 by Nicholas Morg an, a post-doctoral fellow at the [Yale Center for Astronomy and Astrophysics](#), using the 3.5-meter WIYN Telescope at the Kitt Peak National Observatory near Tucson, Arizona. The lens is located near the constellation Hercules and is officially known as SDSS 1650+4251.

## Dissertations

**total of 38 dissertations posted to SDSS web page  
of these, 7 have been posted in the past 12 months**

**[Thesis 32](#) : [Jakob Walcher](#)** (Advisor: Hans-Walter Rix)

The local black hole mass function

**[Thesis 33](#) : [Markus B. Huber](#)** (Advisor: Hans Boehringer)

Studying the topology of the large-scale structure with new techniques

**[Thesis 34](#) : [Nikhil Padmanabhan](#)** (Advisor: Uros Seljak)

Galaxy correlations as a function of stellar mass

**[Thesis 35](#) : [Luigi C. Gallo](#)** (Advisor: Thomas Boller, Wolfgang Voges)

An X-ray-Optical Study of Narrow and Broad Line AGN with ROSAT and SDSS Data

**[Thesis 36](#) : [Diana Hanbury](#)** (Advisor: Jon Loveday)

Evolution of the Galaxy Luminosity Function (MPhil)

**[Thesis 37](#) : [Lidia Tasca](#)** (Advisor: Houjun Mo, Simon White)

Bulge/Disk decompositions of SDSS galaxies

**[Thesis 38](#) : [Stefan Kautsch](#)** (Advisor: Eva K. Grebel)

The Nature of Flat Galaxies

## CoCo Activities

### current membership:

- \* [Rich Kron \(Chair\)](#)
- \* [Nicole Vogt \(NMSU\)](#)
- \* [Guinevere Kauffmann \(MPA\)](#)
- \* [Josh Frieman \(Chicago\)](#)
- \* [Julianne Dalcanton \(UW\)](#)
- \* [Ethan Vishniac \(Johns Hopkins\)](#)
- \* [Zeliko Ivezic \(Princeton\)](#)
- \* [Jeff Munn \(USNO\)](#)
- \* [Eva Grebel \(MPIA\)](#)
- \* [Joop Schaye \(IAS\)](#)
- \* [Mamoru Doi \(JPG\)](#)
- \* [Brian Yanny \(Fermilab\)](#)
- \* [Anders Jorgensen \(LANL\)](#)
- \* [Daniel Eisenstein \(External Participants\)](#)

## CoCo Review of External Collaborator proposals:

**Analysis of Stellar Spectra**      H. Newberg  
T. Beers (MSU), C. Prieta (UT), R. Wilhelm (Texas Tech)

**Near-Earth Asteroids**      S. Hawley  
E. Bowell (Lowell)

**Spectropolarimetric Studies of Magnetic White Dwarfs**    **H. Harris**  
**G. Schmidt (Arizona)**

**High-Velocity Clouds**      D. York  
B. Wakker (U. Wisc.)

**Search for Variable White Dwarfs**    S. Kleinman  
D. Winget, A. Mukadam, F. Mullally (U. Texas)

RK Slide 9

**Modelling the Disruption of Pal 5** E. Grebel  
W. Dehnen (AIP)

**Calar Alto Follow-up Observations of Satellite Galaxies** E. Grebel  
P. Prada (ING)

**Disk Emission Models Applied to Selected AGN Spectra** I. Strateva  
L.-X. Li (CfA)

**Minkowski Functional Statistics** Y. Suto  
T. Buchert, J. Schmalzing, C. Biesbart (LMU, Munich)  
**Parallaxes for L- and T-Dwarfs** F. Vrba  
H. Guetter, C. Luginbuhl (USNO)

RK Slide 10

## **CoCo activities, continued**

**review AAS Special Session programs**

**create scientific agenda for Collaboration meetings**

**involvement with publication issues (e.g. Prada et al.)**

**consultation on data-access issues (e.g. DEEP astrometry)**

RK Slide 11

## **AAS Special Sessions - past and planned**

**Albuquerque - June 2002 Large Scale Structure with the SDSS**

**Seattle - January 2003 Stars and Galactic Structure in the SDSS**

**Nashville - May 2003 Galaxy Clustering in the Sloan Digital Sky Survey**

**Atlanta - January 2004 proposal declined for Cosmology with the SDSS**

**Denver - May 2004 ?**

RK Slide 12

## **Session 65. Stars and Galactic Structure in the Sloan Digital Sky Survey**

**January 7, 2003, Seattle**

65.01 [The Metallicities of SDSS Stars in the Halo and Thick Disk of the Galaxy – Implications for Galaxy Formation](#)

*T.C. Beers (Michigan State University)*

65.02 [Halo Structure and Ghostly Streams](#)

*H. J. Newberg (Rensselaer Polytechnic Institute)*

65.03 [Mining the Galaxy: White Dwarfs in the SDSS](#)

*S. J. Kleinman (Apache Pt. Observatory)*

65.04 [The SDSS Brown Dwarf Survey](#)

*G. R. Knapp (Princeton University)*

65.05 [The Scale Height of the Thick Disk](#)

*C. M. Rockosi (University of Washington)*

65.06 [Triumph of the Dwarfs: Eaint Carbon Stars in the SDSS](#)

*B. Margon (STScI)*

## **Session 51 Galaxy Clustering in the Sloan Digital Sky Survey**

**May 29, 2003, Nashville**

51.01 **Galaxy Properties as a Function of Environment**

*C.J. Miller, R.C. Nichol, P.L. Gomez, M. Bernardi (CMU), A.M. Hopkins, A.J. Connolly (Pitt), SDSS Collaboration*

51.02 **The Stellar Mass, Metallicity, and AGN content of SDSS Galaxies as a Function of Local Environment**

*C. A. Tremonti (JHU / Steward Observatory), T. M. Heckman (JHU), G. Kauffmann, S. Charlot, J. Brinchmann, S. White (MPA), M. Seibert (JHU)*

51.03 **The overdensities of galaxy environments as a function of luminosity and color**

*D. W. Hogg (NYU), SDSS Collaboration*

51.04 **Early-Type Galaxies and their environment: constraints on models of galaxy formation**

*M. Bernardi (Carnegie Mellon University), SDSS Collaboration*

51.05 **Galaxy Biasing and Mass-to-light Ratios from Weak Lensing in the SDSS**

*E.S. Sheldon (Center for Cosmological Physics, U. of Chicago), J. Frieman, D. Johnston (University of Chicago), T. McKay (University of Michigan), SDSS Collaboration*

51.06 **Properties of Void Galaxies in the SDSS**

*M. S. Vogeley, R. R. Rojas, F. Hoyle (Drexel University)*

## **Collaboration Meetings**

**July 2002 - Princeton, NJ**

**April 2003 - Flagstaff, AZ**

**Fall (October?) 2003 - Batavia, IL**

**Spring 2004 - Las Cruces, NM**

## **Recent Press Releases**

**Clustering in Universe Seen as Indicator of Galaxy Evolution - May 26**

**Sloan Digital Sky Survey Probes Dark Matter Theory - May 21**

**Three Distant Quasars Found at Edge of Universe - Jan 9**

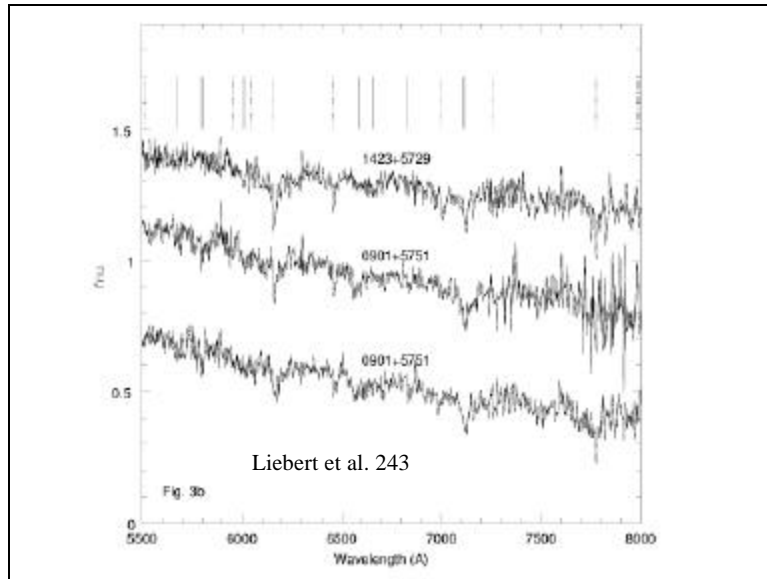
**Distant Ring of Stars Found Circling Milky Way - Jan 6**

## **Working Groups, Chairs, and Activities**

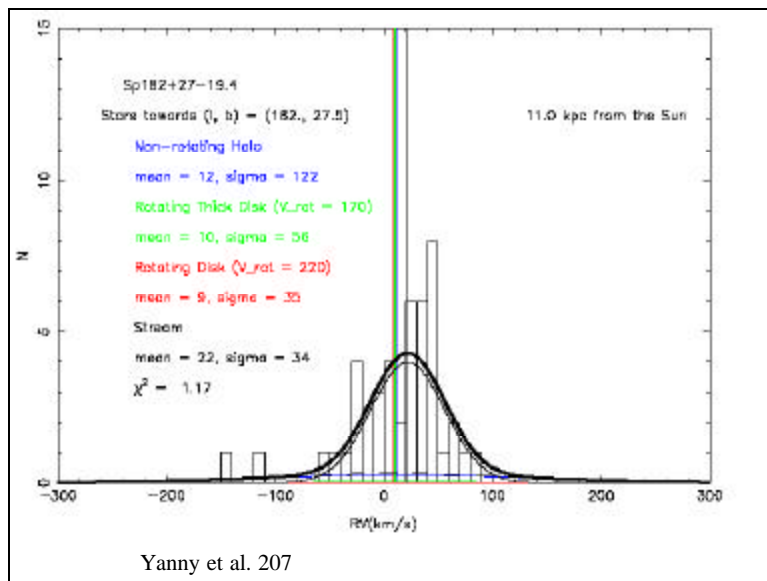
<b>large-scale structure</b>	<b>Frieman, Szalay</b>
<b>galaxies</b>	<b>Eisenstein</b>
<b>quasars</b>	<b>Schneider, deputies Fan and Richards</b>
<b>stars</b>	<b>Hawley, Newberg</b>
<b>clusters</b>	<b>N. Bahcall</b>
<b>solar system</b>	<b>Quinn, deputy Ivezić</b>
<b>serendipity</b>	<b>Anderson</b>

- planning AAS Special Sessions**
- SEGUE white paper**
- white dwarf group**
- DR1 quasar catalog (16,701 entries)**
- cluster catalog**
- coordination of follow-up observations of candidate lenses**

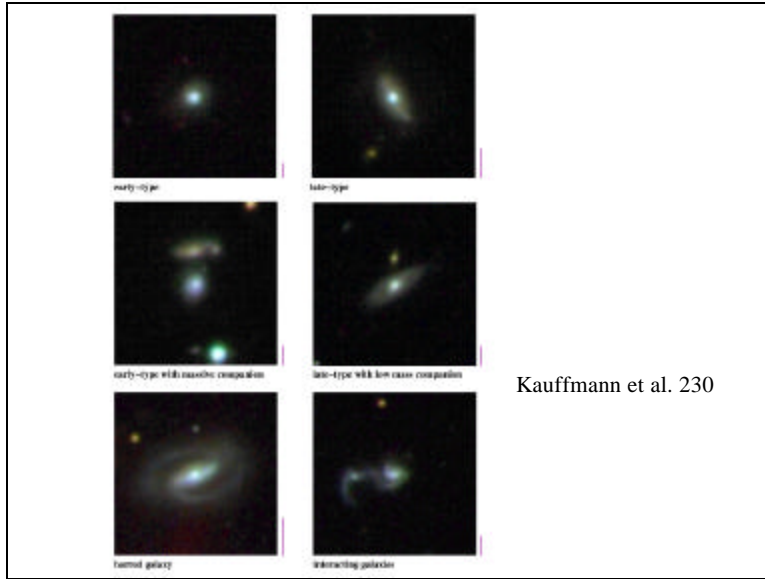
RK Slide 17



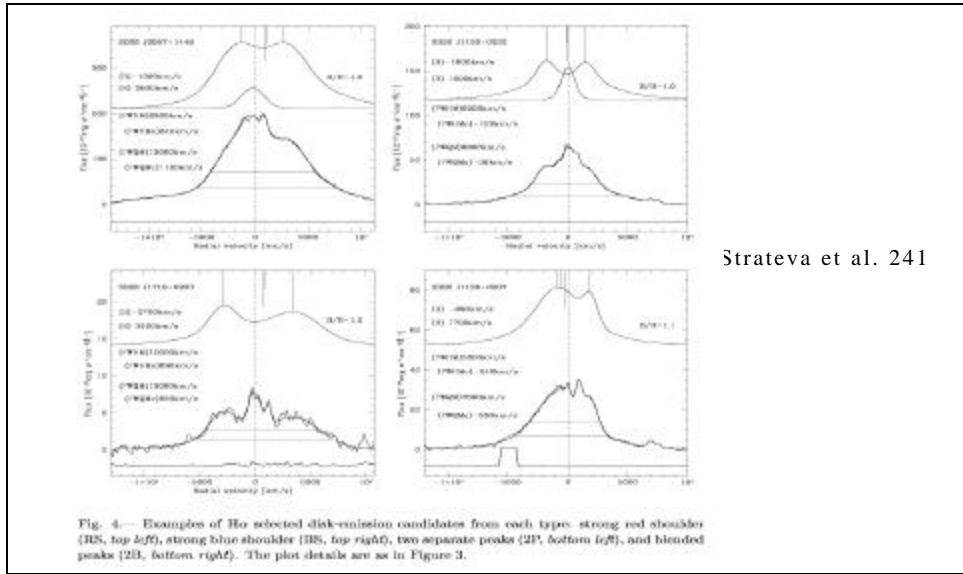
RK Slide 18



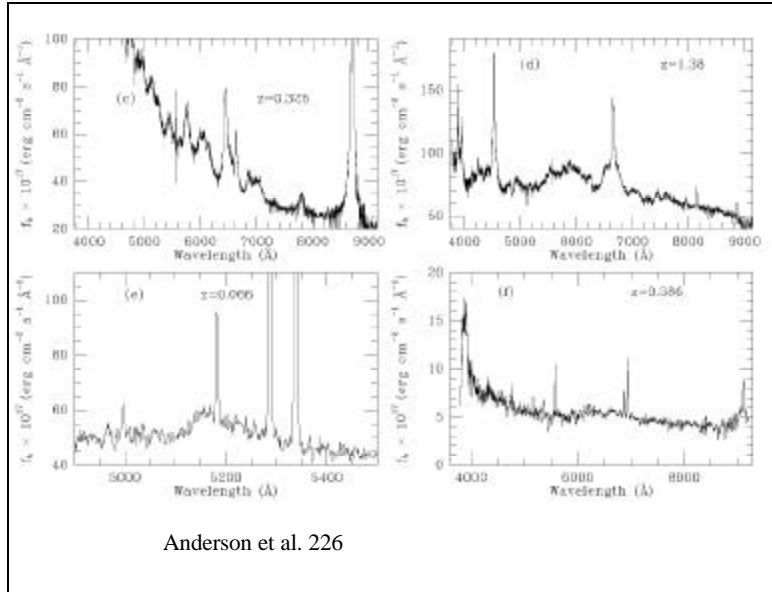
RK Slide 19



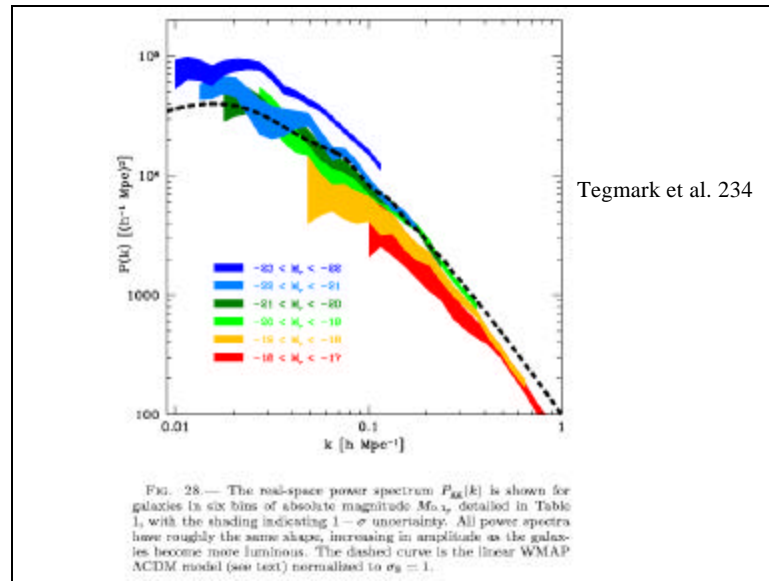
RK Slide 20



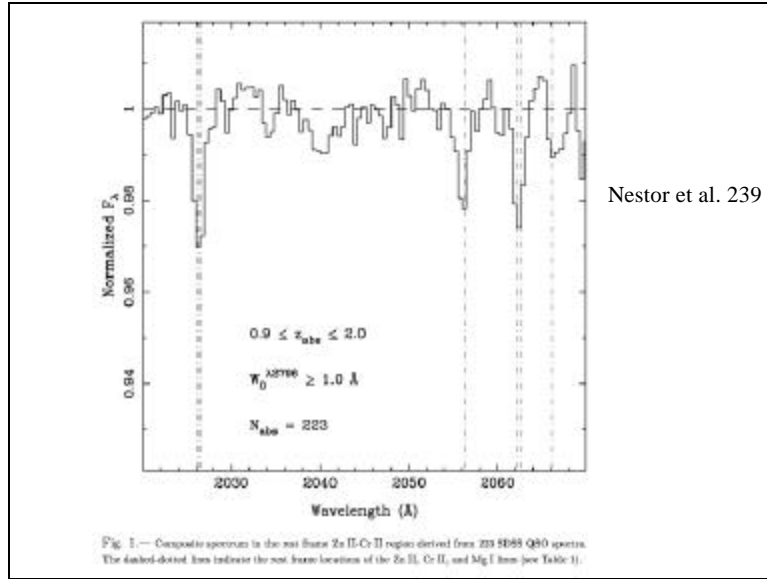
RK Slide 21



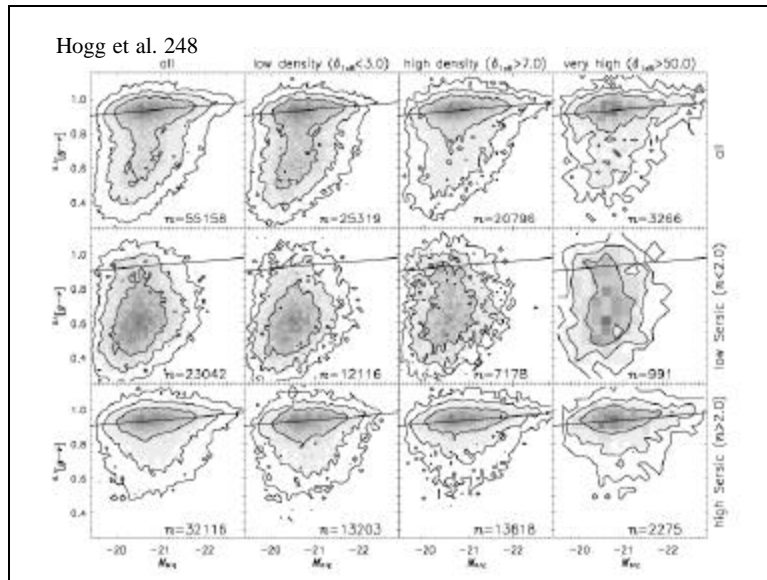
RK Slide 22



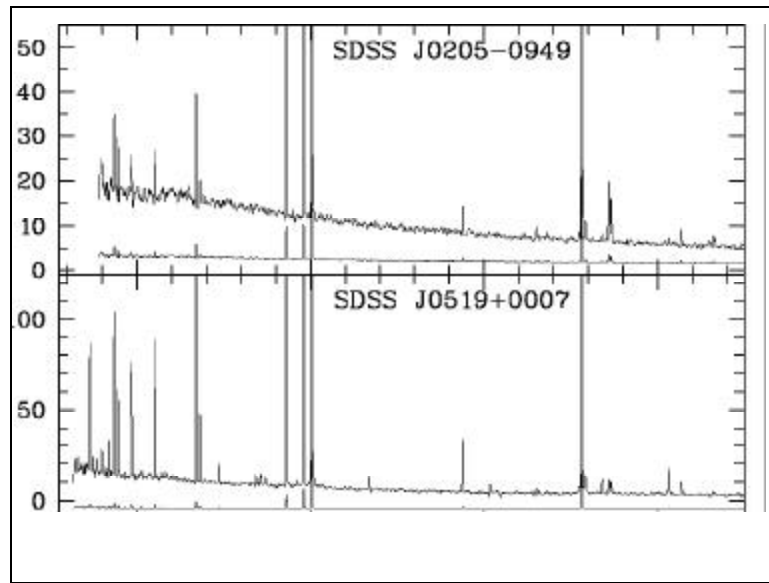
RK Slide 23



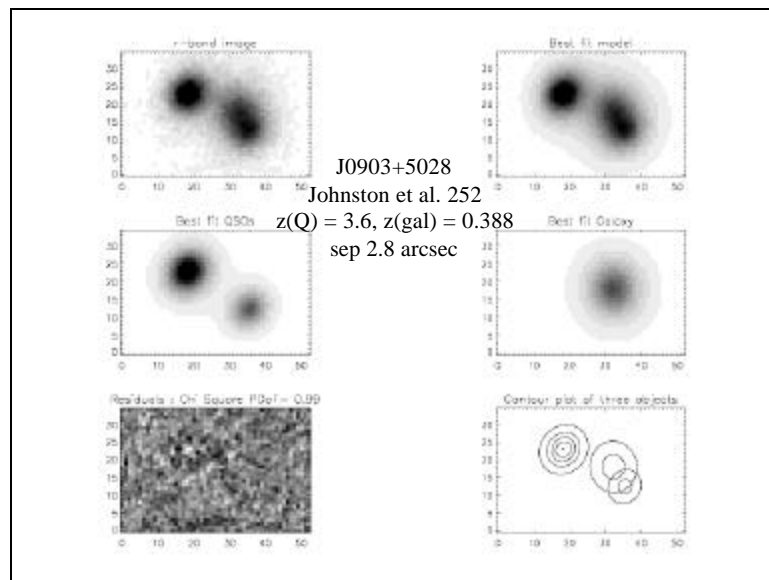
RK Slide 24

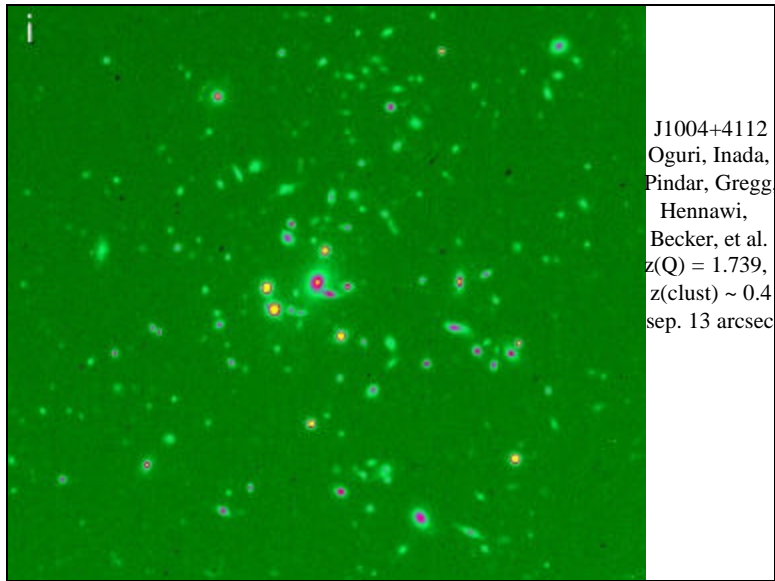


RK Slide 25



RK Slide 26





## APPENDIX 4

### Report of the SDSS Futures Committee on SDSS Extension White Papers

Hawley (chair), Heckman, Kolb, Pier, Friedhorsky, Strauss, Turnshek, Walterbos, White, [Okamura, Turner]

June 6, 2003

#### 1. Process

The Futures committee consists of the eleven science representatives on the SDSS Advisory Council, with the exception that Michael Strauss represented Princeton in place of Scott Tremaine. The white papers for possible SDSS extension projects were made available to the Futures committee via the SDSS stars working group website on May 24, 2003. The committee met by phone conference for approximately one hour on each of May 28, 2003 and June 4, 2003. All members of the committee were able to attend at least one of the phone meetings except Sadanori Okamura (JPG) who was content to receive reports of the activity, and Michael Turner (Chicago). Nearly all members attended, or sent representatives, to both meetings. Therefore the following report should be considered as having broad input across the institutions represented on the Advisory Council.

#### 2. Goals

Discussion at the first phone conference, including input by Jeff Pier (Chair, SDSS Advisory Council) and Rich Kron (Spokesperson, soon to be Director), resulted in the following statement of goals for the committee:

A. Assess science justification for each proposed extension project. Other points for discussion include scientific interest from the collaboration for the project and fundability.

B. Provide recommendation for how the collaboration should proceed, based on results of (A).

#### 3. Project Assessments

To address goal 2.A., each project is assessed separately below based on scientific justification, scientific interest, and fundability. These assessments are summaries of the discussion; individual points of view are reprinted in full in the "Feedback" section at the end of this report. Comments on the scientific justification contained in the Feedback to proposers are meant to be constructive points that the authors should address if the white papers are turned into actual proposals for funding at some future date. The time domain white paper (STSS) was divided into two separate projects on Near Earth Asteroids and Supernovae respectively, for purposes of assessment, as the authors of that white paper made clear that the two projects must be carried out independently to be scientifically competitive.

-----

White Paper 1: Legacy Proposal (Filling the Gap) - Strauss, et al.

1. Scientific Justification:

The scientific justification for the legacy proposal was felt to be the weakest of any of the white papers. Most of the committee agreed that the photometry was very important for the legacy aspect, but there was divided opinion on the spectroscopy (though the majority also felt it was important). It is clear that significant work must be done to strengthen the science case if this proposal hopes to achieve funding on its own scientific merit.

2. Scientific Interest in the Collaboration

In contrast to the justification, the committee was in widespread agreement that it is of very strong interest to the collaboration to fill the gap in photometry (everyone) and spectroscopy (most members).

3. Fundability

This was not addressed in the white paper, and the committee agreed that funding may be a difficult task. The hope is to convince NSF of the importance of the legacy dataset, and to approach the Sloan Foundation with the argument that for a modest additional investment, most (and the most important part) of what was promised can be achieved. Fermilab has indicated it would seek to provide in-kind contributions for this effort.

-----

White Paper 2: SEGUE proposal (Galactic Structure) - Newberg, et al.

1. Scientific Justification

The scientific case for the galactic structure proposal was felt to have considerable merit. This is a very interesting and topical area of research at the moment, as evidenced by several other proposed efforts in this field. The particulars of the scientific case presented in the present white paper need to be improved in a number of ways (see Feedback), and must address issues raised by competitive proposals not described in the white paper. Significant additional effort will be required to turn this white paper into a competitive funding proposal.

2. Scientific Interest within the Collaboration

This white paper clearly had the highest level of scientific interest within the collaboration. The majority of institutions said that this effort was aligned with the goals of their scientists. In addition, the fact that the operational model for data acquisition and processing is basically identical to the current survey was felt to be a major benefit of this proposal by many members of the committee.

3. Fundability

The white paper mentions the NSF and various foundations as possible funding sources. The committee felt that the NSF was the natural government source for this type of science, but many members expressed skepticism that money on the order of \$10M will be available from the NSF for this effort. Fermilab has indicated it would seek to provide in-kind contributions for this effort.

## White Paper 3: STSS Proposal (Time Domain) - Hogan, et al.

### Proposal 3a: Near Earth Asteroids

#### 1. Scientific Justification

Members of the committee by and large did not feel they had the expertise to judge the scientific merit of the proposal. The case made by the white paper that STSS could vastly outperform current surveys (see Figure 3) was not contested. An advantage of this proposal is that the 2.5m telescope/camera system would be competing against existing 1-2m telescopes with less sophisticated instrumentation. A future consideration is that proposed projects (PanSTARRS, LSST) will be designed to carry out NEA studies with superior capabilities than the current SDSS system. A competitive NEA program would take approximately five years to complete with the SDSS system, which is longer than any of the other proposed extension plans (and presumably more expensive).

#### 2. Scientific Interest within the Collaboration

The scientific interest within the collaboration was by far the weakest for this proposal. None of the institutions has a strong program in asteroid studies. Several members of the committee felt that this proposal was at the level of "money-grubbing" - proposing to carry out the work simply to get the money - and that this was a bad thing. Also, the data would be taken in binned mode, and there was some concern that this would contribute significantly to operational overhead (although the white paper claims that this is not the case).

#### 3. Fundability

The natural funding source for NEA work is through NASA. There is an existing NASA program for NEA studies funded at approximately \$3-4M/year. It is not clear if additional money could/would be devoted to this effort (many members expressed skepticism that additional funds would be found). Bruce Margon is willing to act as a contact to the Solar System people within NASA if requested to do so by SDSS management.

### Proposal 3b: Supernovae

#### 1. Scientific Justification

Obtaining supernovae light curves in the redshift range  $z=0.1-0.3$  was felt to be an important and interesting science topic. Questions arose about supernova phenomenology and the need for spectra; the usefulness of the data for cosmological studies (determining  $w$  under various theories); and the exact redshift range that is currently unexamined (is it only 0.1-0.2 rather 0.1-0.3?). These questions should be addressed before the white paper is turned into a serious funding proposal.

#### 2. Scientific Interest within the Collaboration

The scientific interest within the collaboration was mixed. Some institutions professed little or no interest, while others thought it was aligned with their interests, and others felt that the variability data that would be a natural byproduct of the supernova study would be of considerable interest. An advantage is that the program only needs 5 quarters of data, with no requirement on time of year, so that it fits well with the Legacy program.

#### 3. Fundability

Proposed funding sources in the white paper include NSF, NASA and the Department of Energy. The committee members were mixed on their view of whether significant funding was realistic. Los Alamos (LANL) has indicated interest in supplying in-kind contributions for this study. Craig Hogan is willing to act as a contact with DOE.

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#### 4. Recommendation

1. The Committee was in agreement that the proposed science projects submitted in the white papers had sufficient scientific merit, and passed the "sniff test" at the level that funding agencies could now be approached.

2. The recommendation of the Futures Committee is that the SDSS Director and Management, in consultation with the authors of the various projects, carry out a series of discussions with the funding agencies and foundations described in the proposals. Help has been offered from various sources in the white papers, and the authors may have additional ideas about the best approaches to make to the agencies/foundations.

3. The results of this set of discussions, which should commence immediately and perhaps will last through the summer, should lead to a decision about which proposal, or combination of proposals, to take forward to the next stage of a serious funding proposal effort. Many on the committee feel that there is considerable urgency, and that this decision must be made very soon (Fall, 2003).

4. The feedback provided by the committee should be communicated to the white paper authors, with the hope that they will begin preparing for the next stage effort.

#### 5. Feedback

*(The Feedback section of the Futures Committee report has been removed from sdss-general version of these minutes.)*

#### 6. Funding from Current SDSS Institutions

The only concrete proposal for future funding from the current SDSS institutions came from Fermilab, as follows:

In terms of scientific interests, the strongest support is to fill the gap. There is a unanimous opinion that this is the highest priority. In particular, closing the existing gap between stripes 10 and 37 is a prime goal of the Fermilab group.

Next in terms of scientific interests is the Galactic Plane survey, both imaging and spectroscopy, to probe structures in the Milky Way halo and other Milky Way research.

For a 2-year extension of the existing 5 year SDSS survey, in support the above work we would propose to the Fermilab Director that we provide the following in-kind resources:

1. Continue to provide three engineers/technicians to support the telescope and instruments at APO.
2. Continue to process (unbinned) imaging and spectroscopic data at Fermilab in support of the two programs above using the existing versions of data processing pipelines, adding bug fixes only.
3. Continue to operate the data archive server at Fermilab and add the main survey data to the public archive.
4. Explore the possibility of providing two computing professionals to replace the Unix side of the data acquisition system with a modern Linux system.

We note again that any commitment of resources must be approved by the Fermilab Director.

While we acknowledge the interesting science contained in the time domain program, at present there is very little scientific interest at Fermilab, but it is possible that such interest could develop in the future.